Stem and Leaf Project

Objectives:

* Read, use, and develop established code.
* Adjust the given Linked List code for a practical application
* Understand the mathematical and overall design of a Stem and Leaf table.
* Review file I/O code.
* Manipulate Linked Lists.
* Understand how to design a data structure within a data structure (nested).

General Information on Stem and Leaf:

Instead of discussing it here, use the links below to familiarize yourself with a Stem and Left structure.

Make sure you read the material in the following links before you go on reading. <https://www.mathsisfun.com/data/stem-leaf-plots.html>

<https://www.khanacademy.org/math/ap-statistics/quantitative-data-ap/histograms-stem-leaf/v/u08-l1-t2-we3-stem-and-leaf-plots>

<https://en.wikipedia.org/wiki/Stem-and-leaf_display>

Below is the overall design of the Stem and Leaf for our Project.

Diagram

Description automatically generated

File of terms (Data)

As shown in all the examples above, data is required. The file given and the files used to test your program will:

1. Start off with 2 values, on separate line, that denote the Unit and Stem values, respectively.
2. After the 1st two lines, all will be terms (data).
3. All data will be integers.
4. For now, the data in the given file and test files will not have any flaws or errors.

Source Code is given.

To get you started, which will not always be the case, some code has been given. You are NOT to change any of the code. You are only allowed to add code. Explanation of each function will be in the code provided.

Implementation

1. The data file will be in the same directory as your driver. Code it that way.
2. To save space there is one major implementation rule. If a duplicate term value is found, the Leaf’s frequency is increased incrementally instead of creating a new leaf node and inserting it into the list.
3. Both the Stem and Leaf linked lists will be ordered by terms.

Hints

1. Reading ALL the code given is imperative. Some of you will just jump on coding and end up repeating stuff I have already given you and waste time.
2. Notice my “design”. Amazing how a picture (design) can answer a thousand words. You should try it. (For your next project).
3. Make sure to Valgrind your project when “all done”. That will be a deduction if we find a memory leak.
4. Create a small test file. “Draw” what the Stem and Leaf should look like. Then make sure your output is the same.
5. Start small. Start with the Leaf linked list. Insert data manually, and see if it looks right.
6. ***You can use whatever*** IDE you wish.

Submitting

After successful testing of your project, simply zip all .h and .cppfile(s) together and upload them to Canvas.